ReactJS.

Thinking in React

Developing a React web app

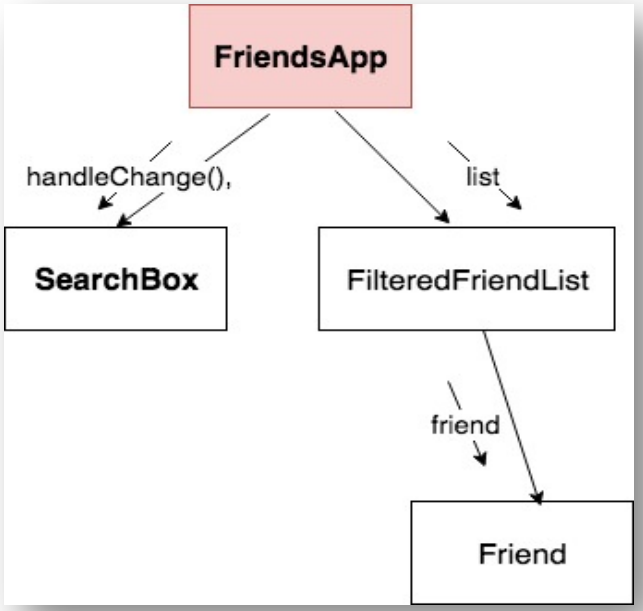
- **Step 1: Break the UI into a** component hierarchy**.**
- **Stap 2: Build a** static version **of the app.**
- **Step 3: Identify the** minimal **representation of** UI state**.**
- **Step 4: Identify where your state should live.**
- **Step 5: Add inverse data flow, if required.**

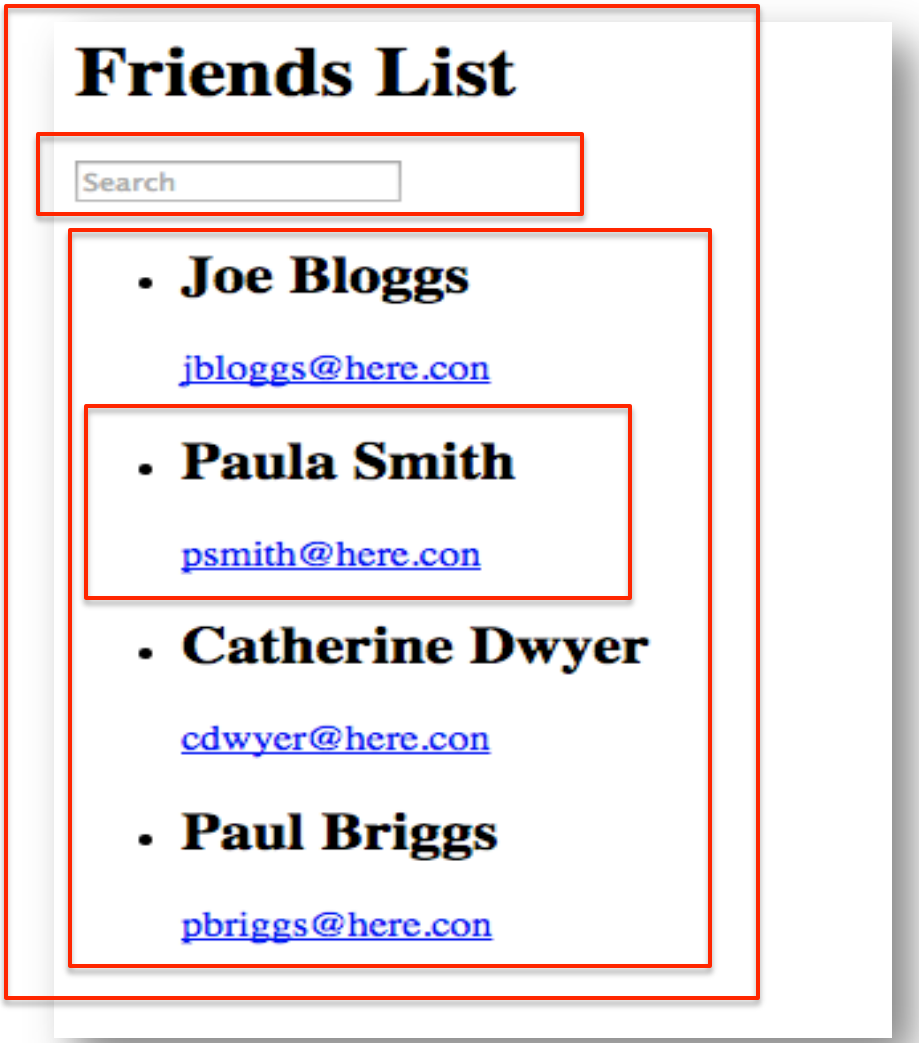
Starting point.

- **At the start of the development process we have:**
  1. **A mock-up of the UI.**
  2. **(Optionally) A JSON representation of the web API data model.**

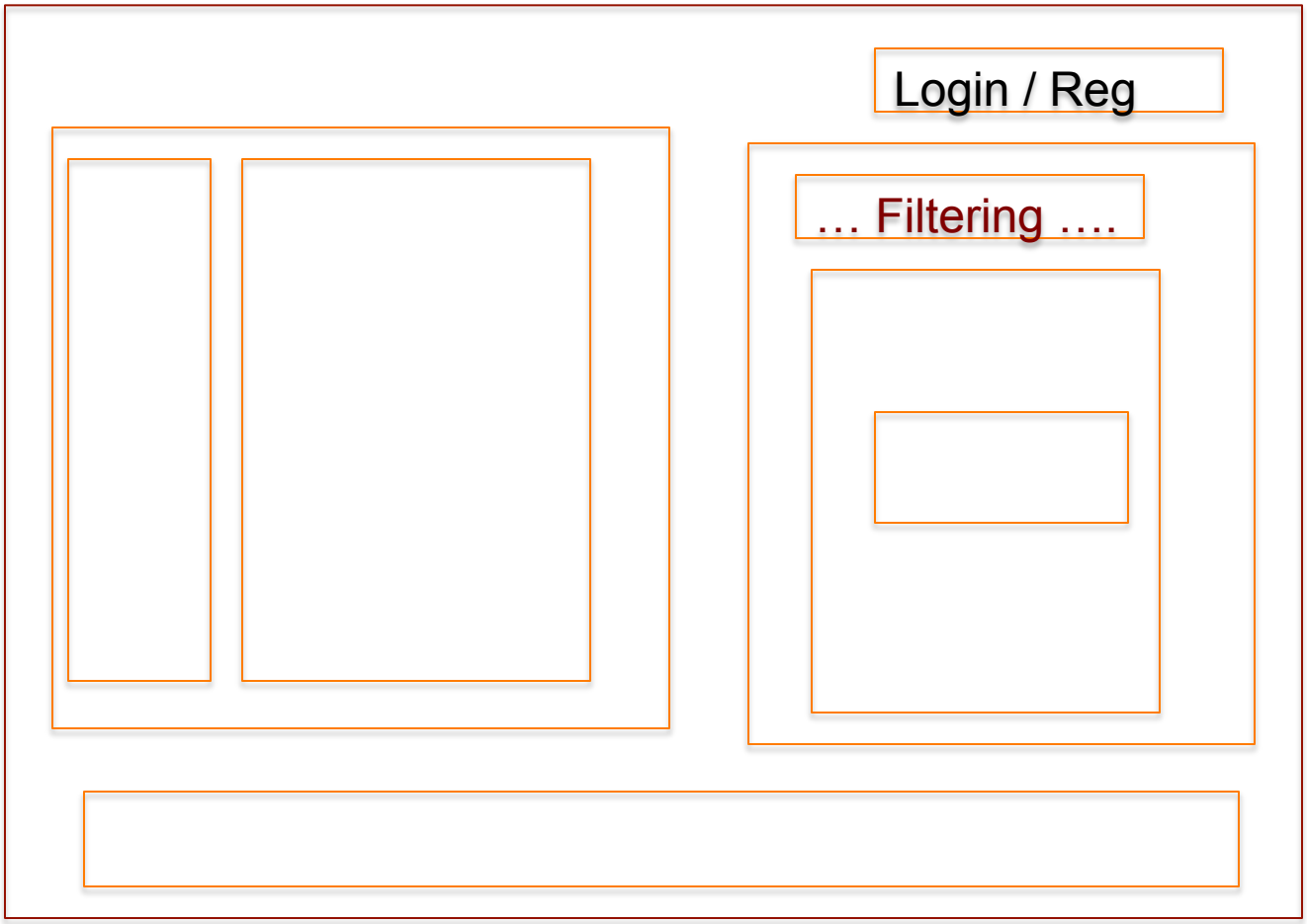
Step 1: Break the UI into a *component hierarchy*.

- **Possibly use the data model as a guide.**
  - **The UI and data models tend to adhere to the same information architecture.**

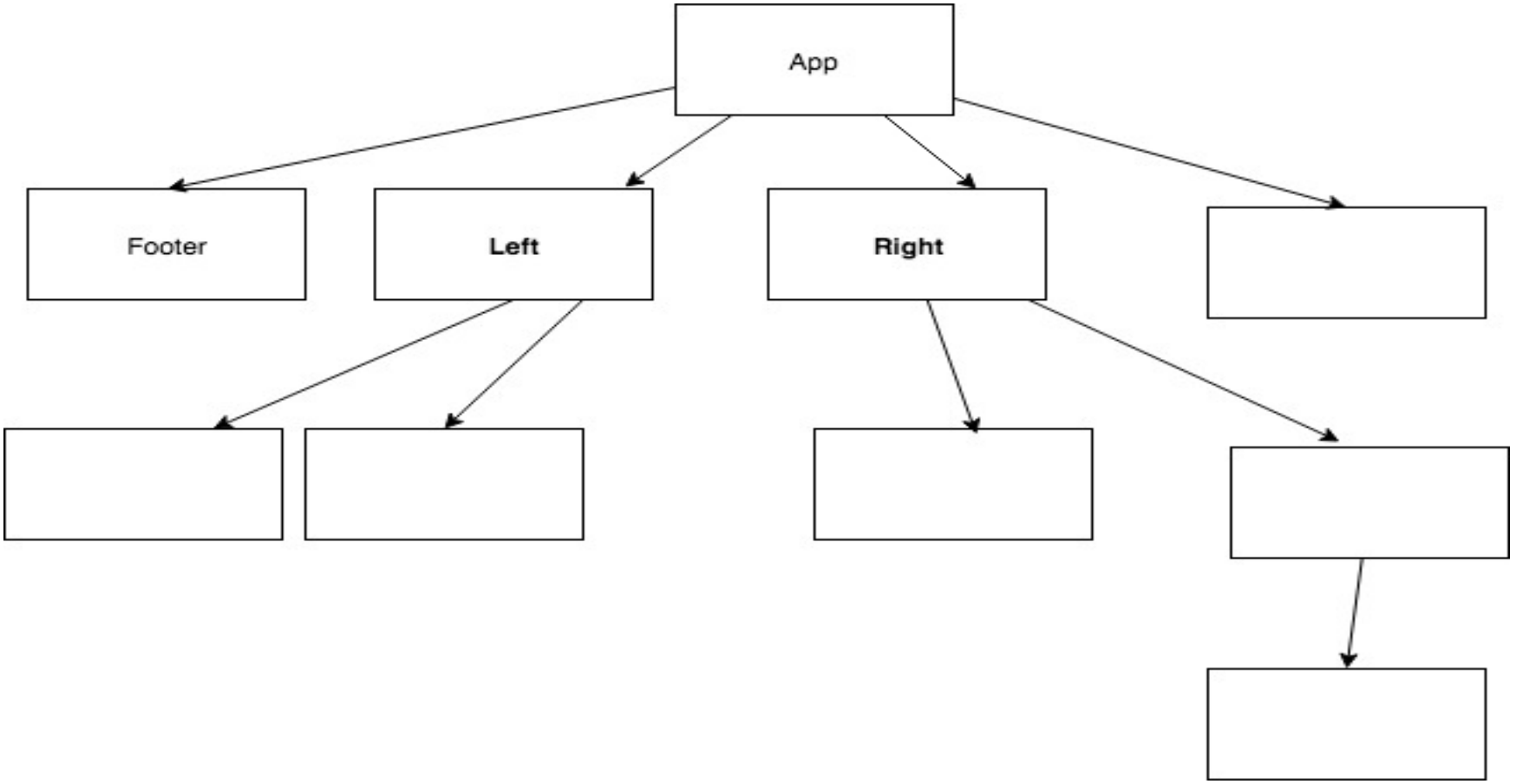


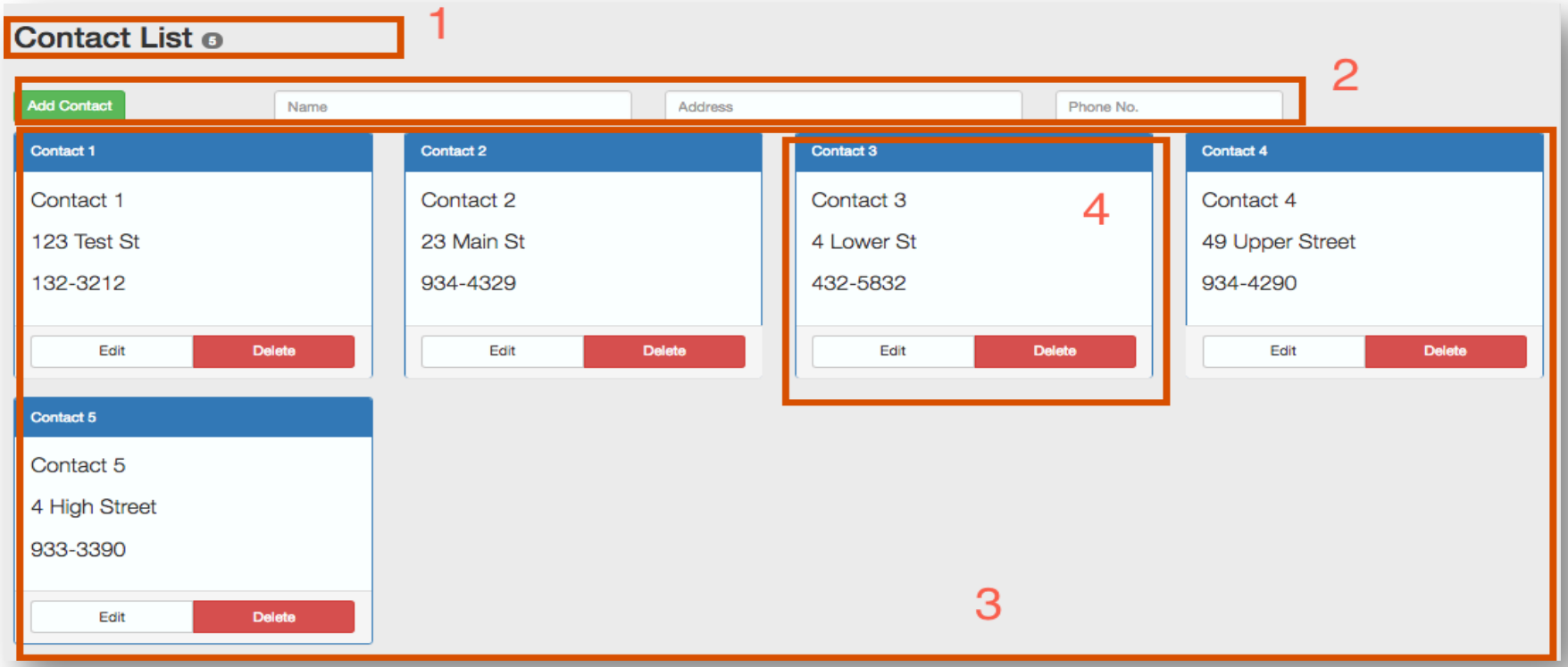


Component hierarchy - Abstract example



Component hierarchy - Abstract example




Contact List 5
1
2
Add Contact
Name
Address
Phone No.
Contact 1
Contact 1
123 Test St
132-3212
Edit
Delete
Contact 2
Contact 2
23 Main St
934-4329
Edit
Delete
Contact 3
Contact 3
4 Lower St
432-5832
Edit
Delete
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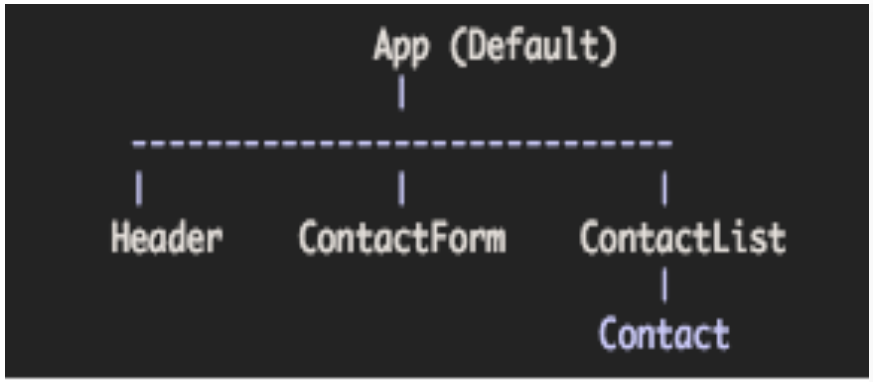
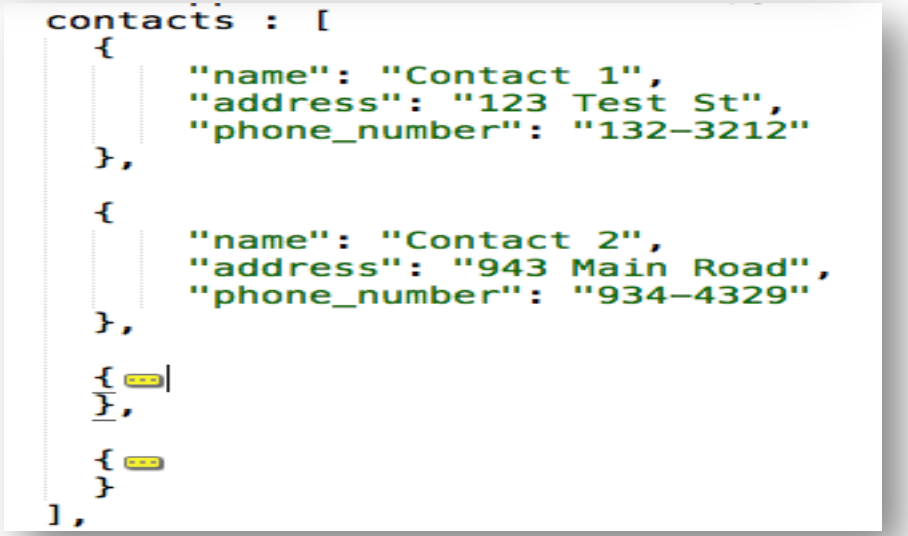
934-4290
Edit
Delete
Contact 5
Contact 5
4 High Street
933-3390
Edit
Delete
3


App (Default)
Header
ContactForm
ContactList
Contact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},
{ ...
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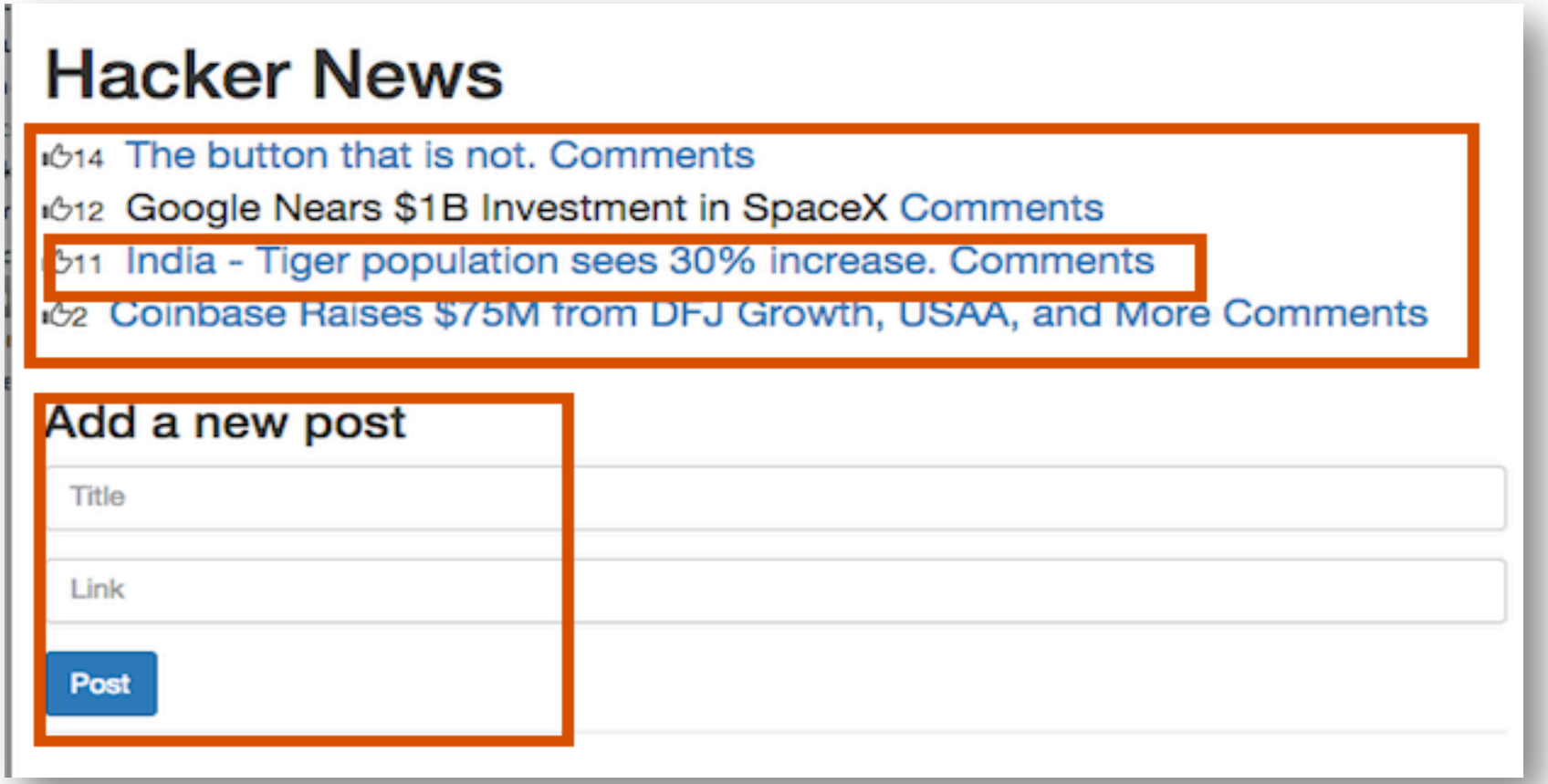


- **Component hierarchy:**

Step 1: Break the UI into a component hierarchy.

- **Additional crtieria for devising component breakdown:**
    1. **The** single responsibility principle.
    2. **If it's doing too much, break it up.**
    3. **If Component has too much code, break it up**

- **[Same principles when dealing with Object Oriented design.]**

Stap 2: Build a static version.

- **Using a sample data set, render the UI** but ignore all interactivity.
- **All components will only have a** render **method; no lifecycle methods or event handlers or state, yet.**
- Design Principle**: Decouple structure from interactivity, initially.**
- **"Lots of typing but little thinking."**
- **Use Storybook to build components.**
  - **Helps determine component prop requirements. ******
  - **Start with 'leaf' components, and work up the hierarchy, e.g. Phone → PhoneList**
  - **Consider multiple stories for a component, e.g. prop boundry values, default value.**

Step 3: Identify the *minimal* (but complete) representation of **UI** *state*.

- **Try to keep as many of the components as possible stateless.**
  - **Stateless components simply render props data**

- **Follow the DRY principle (Don't Repeat Yourself):**
  - **Identify the absolute minimal representation of the state the app needs and compute everything else on-demand, e.g. list of matching friends,**

- **Common app pattern – A stateful component computes the props for its subordinates based on current state, domain data and/or its own props.**

Step 3: Identify UI state.

- **What shouldn't go in State?**
  1. **Domain Data - data retrieved from a Web API/service.**
     - **Temporarily stored on the client-side, but not as UI state.**
  2. **Computed data, e.g. subset of matching friends**
     - **Avoids keeping computed state in sync with user interaction; Just re-compute it when necessary.**
  3. **Copies of props: Props are the 'source of truth'.**
     - **Unless props' previous value(s) effects rendering.**
  4. **React components; State should always be JSON-serializable.**

Step 3: Identify UI state.

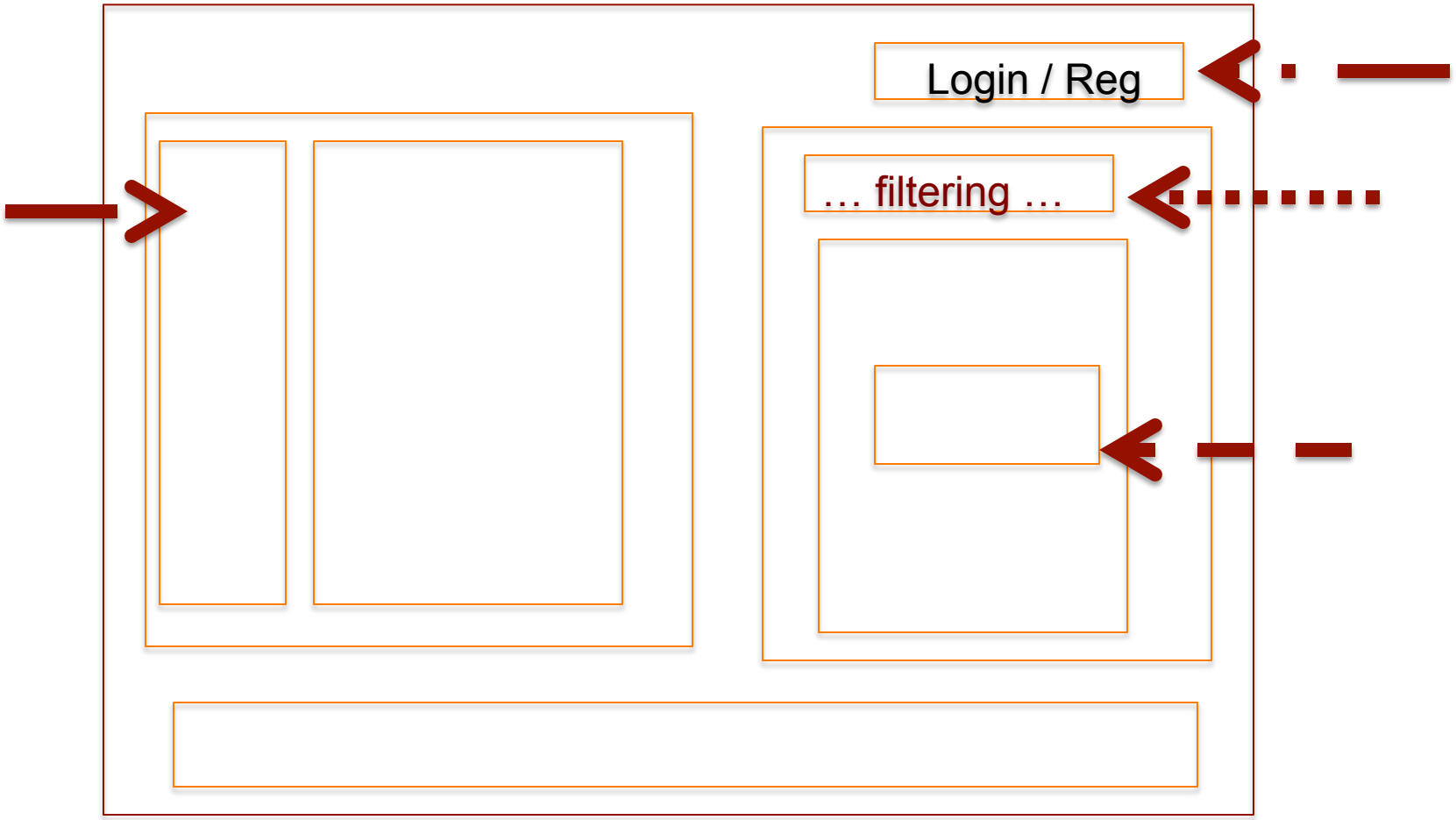
- **What should go in state?**
  - **Data that an event handlers changes, e.g. counter**
  - **User dialogues selections – check box, menu, radio button. input text fields.**

- **How to identify state:**
  1. **Identify all of the places where data appears in the UI.**
  2. **For each one, ask a set of questions:**
     I. **Is it passed in via props? If so, probably isn't state.**
     II. **Is it modifiable? If not, probably isn't state.**
     III. **Can you compute it based on any other state or props? If so, it's not state.**

Example: Filtered Friends app

- **Think of all of the places where data appears in the UI:**
  1. **Full List of friends.**
     - **Supplied from web API → Not state.**
  2. **Search text.**
     - **Modifiable, User input → State.**
  3. **Filtered list of friends.**
     - **Computed → Not State.**
  4. **Friend details (name, etc)**
     - **Passed in as props, Not modifiable → Not state**

Identify UI state - Abstract example

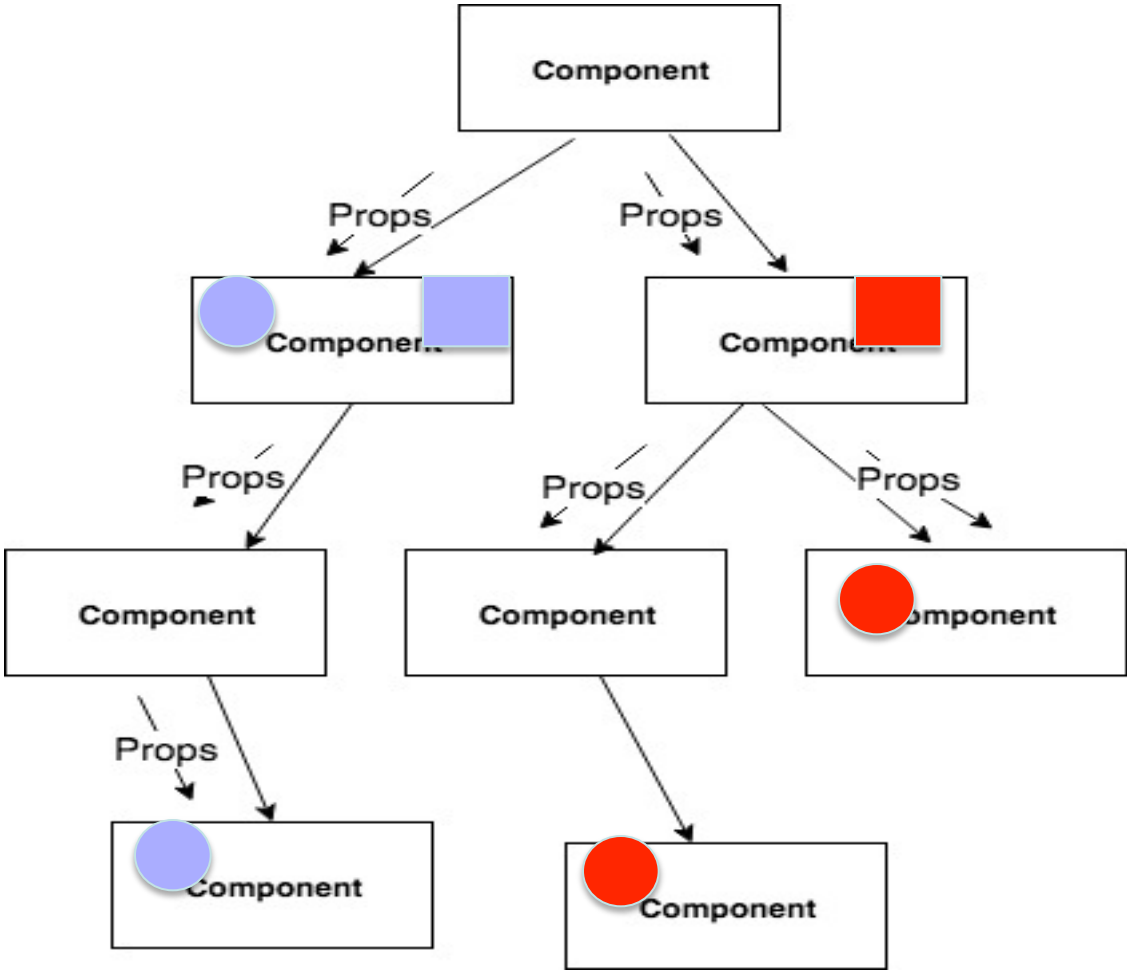


Step 4: Identify where state should live.

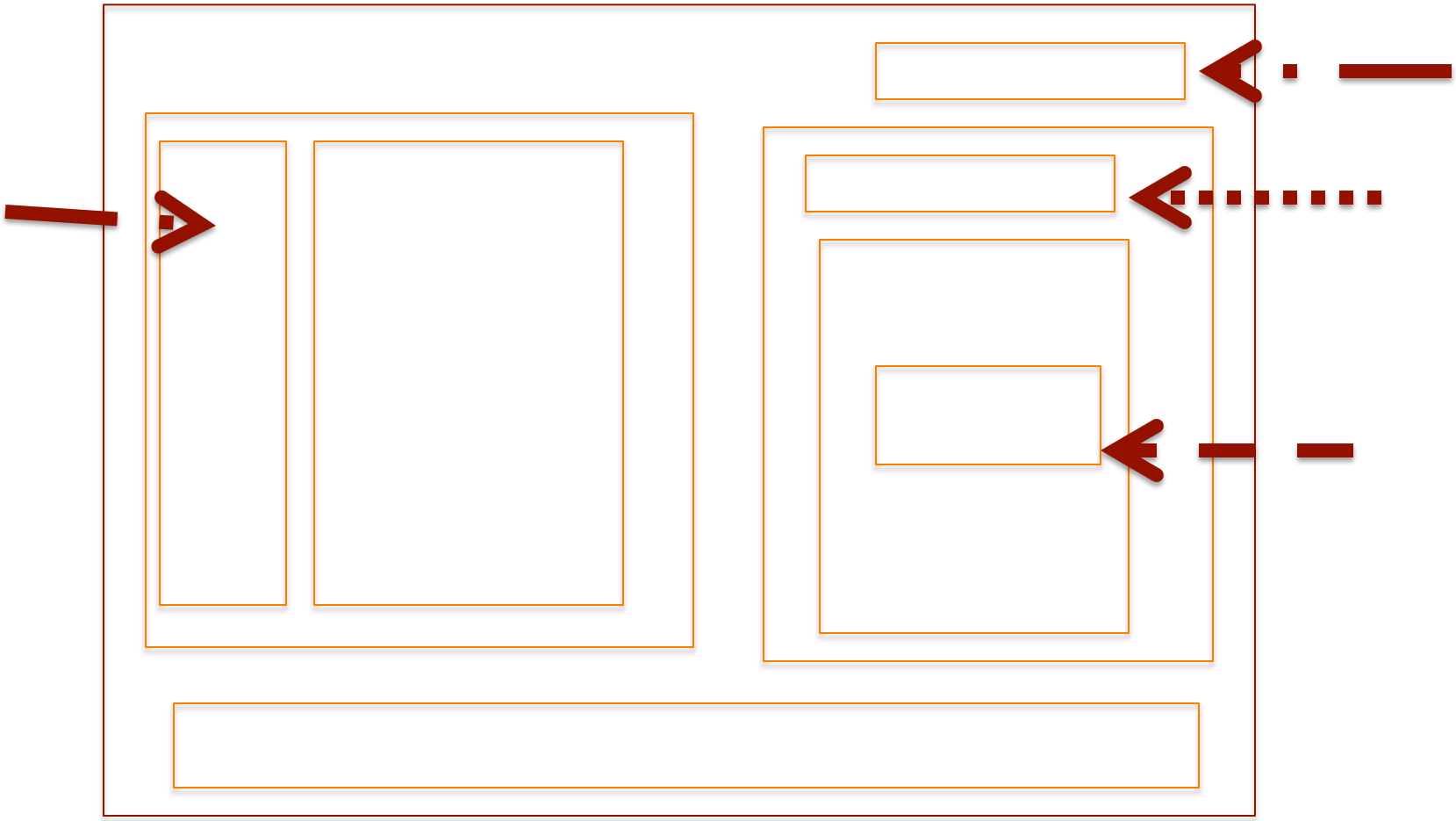
- **For each piece of UI state, go through this process:**
  1. **Identify every component that renders something based on its value.**
  2. **From 1 above, identify the 'common' ancestor component.**
  3. **If there is no obvious candidate, create a new ancestor component.**

- **Add state initialization code to selected ancestor component**

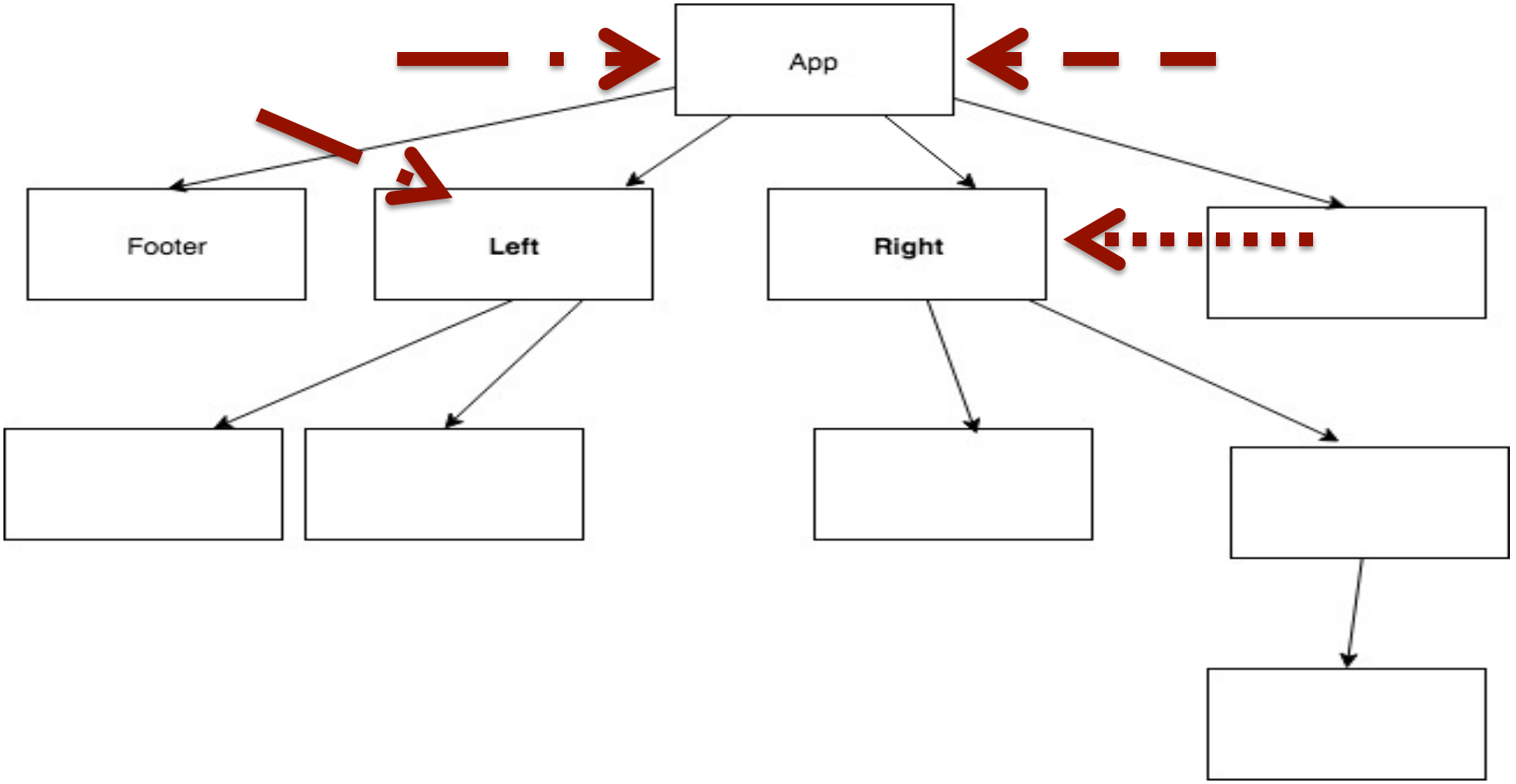
Step 4: Identify where state should live.



Abstract example



Where State lives - Abstract example



Sample: Filtered Friends app

- **Only 1 state variable (searchText).**
- **Design A – 1-way data flow design.**
  - FriendsApp **component needs to display the text & use it to compute the filtered list of friends.**
  - **No other component uses this state.**

- **Design B – Inverse Data Flow design.**
  - FriendsApp **component needs it to compute the filtered list of friends.**
  - SearchBox **component needs to display it in the text field.**

  → FriendsApp **is a 'common' component**

- **Can now add state initialization code to ststeful components.**

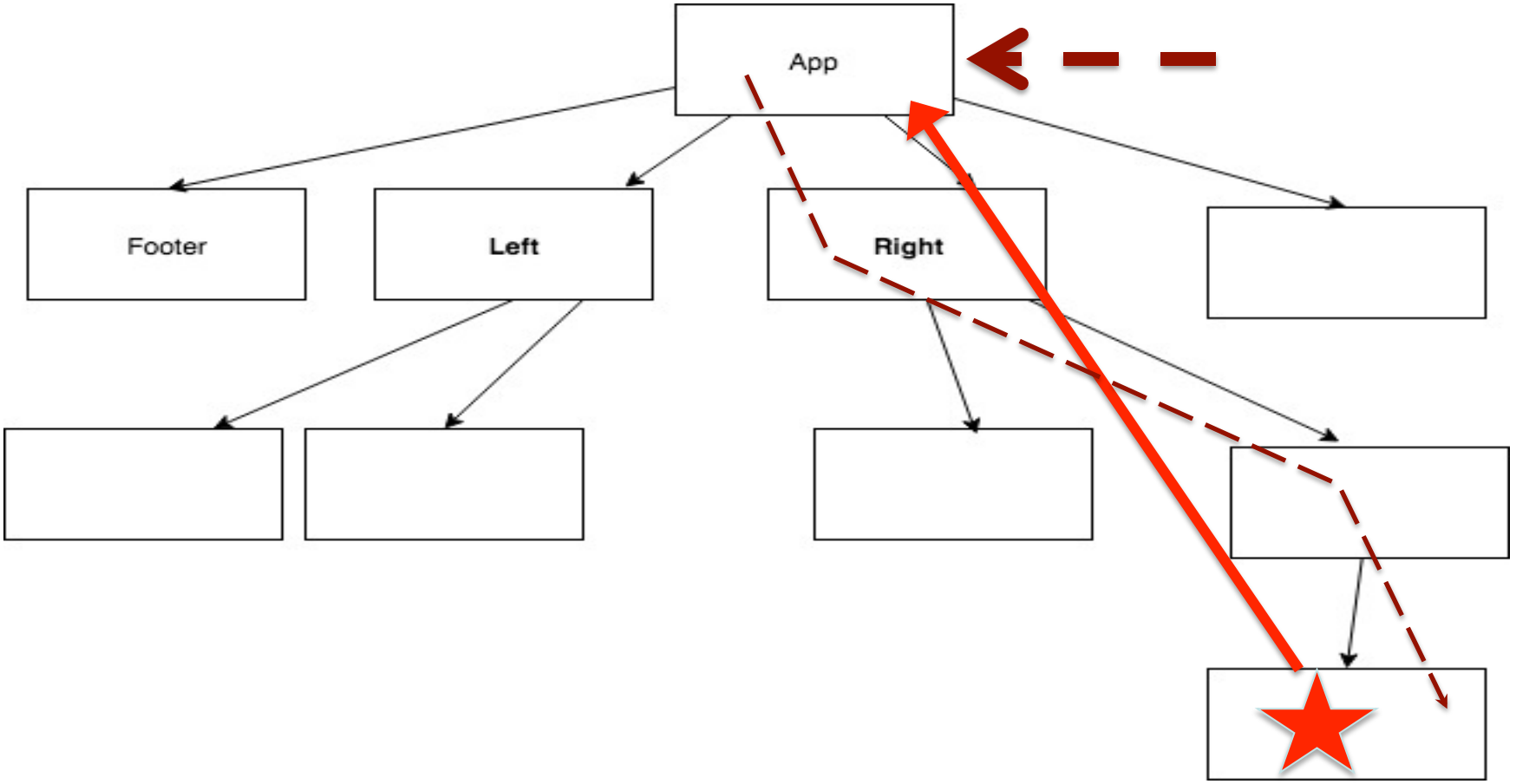
Step 5: Add inverse data flow

- Problem: **A component's state changes when the user interaction with a deeper nested component.**
  - **The browser event occurs in the nested component.**
  - **The nested component must communicate the** event **to the (superordinate) stateful component.**

- Solution: **Inverse data flow pattern:**
  - **Stateful component passes (as a prop) a local function reference to the nested component.**
  - **Nested component calls function when event fires.**

- **Update Storybook stories to reflect additional props**

Inverse data flow - Abstract example



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